

APPLICANT: Milton G. Smith  
DATE: September 17, 2003

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claims 1-13 (cancelled)

Claim 14 (New): A method of treating a disease or injury induced by pathological free radical reactions in a mammal exposed to a caustic gas, the method comprising administering to a mammal an effective amount of an amphipathic antioxidant composition comprising:

- (i) a population of liposomes suitable for undergoing peroxidation and lysis; and
- (ii) at least two non-enzymatic antioxidants,

wherein the amphipathic antioxidant composition quenches free radicals and reduces the damage induced by the caustic gas exposure.

Claim 15 (New): The method of claim 14, wherein said non-enzymatic antioxidants are selected from the group consisting of: beta-carotene, vitamin E, vitamin C, glutathione, niacin, and N-acetyl-cysteine.

Claim 16 (New): The method of claim 14, wherein at least one of the non-enzymatic antioxidants is hydrophilic and at least one of the non-enzymatic antioxidants is hydrophobic.

Claim 17 (New): The method of claim 14, wherein said composition further comprises at least one trace metal.

Claim 18 (New): The method of claim 17, wherein said at least one trace metal is selected from the group consisting of zinc, selenium, chromium, copper and manganese.

Claim 19 (New): The method of claim 14, wherein said composition further comprises a pharmaceutically acceptable carrier.

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Claim 20 (New): The method of claim 14, wherein said composition is administered by a route of administration selected from the group consisting of: intravenous, intraperitoneal, subcutaneous, intramuscular, intraarticular, intraarterial, intracerebral, intracerebellar, intrabronchial, intrathecal, topical, and aerosol route.

Claim 21 (New): A method of treating a disease or injury induced by pathological free radical reactions in a mammal exposed to a caustic gas, the method comprising administering to a mammal an effective amount of an amphipathic antioxidant composition comprising:

- (i) a population of liposomes suitable for undergoing peroxidation and lysis; and
- (ii) beta-carotene, vitamin E, vitamin C, glutathione, and niacin,

wherein the amphipathic antioxidant composition quenches free radicals and reduces the damage induced by the caustic gas exposure.

Claim 22 (New): The method of claim 21, wherein said amphipathic antioxidant composition further comprises at least one trace metal.

Claim 23 (New): The method of claim 22, wherein said at least one trace metal is selected from the group consisting of zinc, selenium, chromium, copper and manganese.

Claim 24 (New): The method according to claim 22, wherein composition includes an amount of beta-carotene, vitamin E, vitamin C, glutathione, niacin, and trace metals sufficient to deliver 0.0005-1.0 g beta-carotene per kg body weight, 0.001-10 g vitamin E per kg body weight, 0.001-2.0 g vitamin C per kg body, 0.001-2.0 g glutathione per kg body weight, 1-1000 mg niacin per day, and 1-1000 µg trace metals per day.

Claim 25 (New): The method according to claim 22, wherein the composition includes an amount of beta-carotene, vitamin E, vitamin C, glutathione, niacin, and trace metals sufficient to deliver 0.005-1.0 g beta-carotene per kg body weight, 0.01-1.0 g vitamin E per kg body weight, 0.01-1.0 g vitamin C per kg body, 0.01-1.0 g glutathione per kg body weight, 10-100 mg niacin per day, and 10-100 µg trace metals per day.

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Claim 26 (New): The method according to claim 22, wherein the composition includes an amount of beta-carotene, vitamin E, vitamin C, and glutathione sufficient to deliver 0.05-1.0 g beta-carotene per kg body weight, 0.1-1.0 g vitamin E per kg body weight, 0.1-1.0 g vitamin C per kg body, 0.1-1.0 g glutathione per kg body weight, 10-100 mg niacin per day, and 10-100 µg trace metals per day.

Claim 27 (New): A method for reducing the deleterious effects of pathological free radical reactions in a mammal with a disease or injury induced by exposure to a caustic gas, the method comprising administering an effective amount of an amphipathic antioxidant composition comprising:

- (i) a population of liposomes suitable for undergoing peroxidation and lysis; and
- (ii) at least two non-enzymatic antioxidants,

wherein the amphipathic antioxidant composition quenches free radicals and reduces the damage induced by the caustic gas exposure.

Claim 28 (New): The method of claim 27, wherein said non-enzymatic antioxidants are selected from the group consisting of: beta-carotene, vitamin E, vitamin C, glutathione, niacin, and N-acetyl-cysteine.

Claim 29 (New): The method of claim 27, wherein at least one of the non-enzymatic antioxidants is hydrophilic and at least one of the non-enzymatic antioxidants is hydrophobic.

Claim 30 (New): The method of claim 27, wherein said composition further comprises at least one trace metal.

Claim 31 (New): The method of claim 30, wherein said at least one trace metal is selected from the group consisting of zinc, selenium, chromium, copper and manganese.

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Claim 32 (New): The method of claim 27, wherein said composition further comprises a pharmaceutically acceptable carrier.

Claim 33 (New): The method of claim 27, wherein said composition is administered by a route of administration selected from the group consisting of: intravenous, intraperitoneal, subcutaneous, intramuscular, intraarticular, intraarterial, intracerebral, intracerebellar, intrabronchial, intrathecal, topical, and aerosol route.

Claim 34 (New): A method for reducing the deleterious effects of pathological free radical reactions in a mammal exposed to a caustic gas which afflicts the mammal with a disease or injury induced by pathological free radical reactions, the method comprising administering an effective amount of an amphipathic antioxidant composition comprising:

- (i) a population of liposomes suitable for undergoing peroxidation and lysis; and
- (ii) beta-carotene, vitamin E, vitamin C, glutathione, and niacin,

wherein the amphipathic antioxidant composition quenches free radicals and reduces the damage induced by the caustic gas exposure.

Claim 35 (New): The method of claim 34, wherein said amphipathic antioxidant composition further comprises at least one trace metal.

Claim 36 (New): The method of claim 35, wherein said at least one trace metal is selected from the group consisting of zinc, selenium, chromium, copper and manganese.

Claim 37 (New): The method according to claim 35, wherein composition includes an amount of beta-carotene, vitamin E, vitamin C, glutathione, niacin, and trace metals sufficient to deliver 0.0005-1.0 g beta-carotene per kg body weight, 0.001-10 g vitamin E per kg body weight, 0.001-2.0 g vitamin C per kg body, 0.001-2.0 g glutathione per kg body weight, 1-1000 mg niacin per day, and 1-1000 µg trace metals per day.

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Claim 38 (New): The method according to claim 35, wherein the composition includes an amount of beta-carotene, vitamin E, vitamin C, glutathione, niacin, and trace metals sufficient to deliver 0.005-1.0 g beta-carotene per kg body weight, 0.01-1.0 g vitamin E per kg body weight, 0.01-1.0 g vitamin C per kg body, 0.01-1.0 g glutathione per kg body weight, 10-100 mg niacin per day, and 10-100 µg trace metals per day.

Claim 39 (New): The method according to claim 35, wherein the composition includes an amount of beta-carotene, vitamin E, vitamin C, and glutathione sufficient to deliver 0.05-1.0 g beta-carotene per kg body weight, 0.1-1.0 g vitamin E per kg body weight, 0.1-1.0 g vitamin C per kg body, 0.1-1.0 g glutathione per kg body weight, 10-100 mg niacin per day, and 10-100 µg trace metals per day.